FACT SHEET FOR NPDES PERMIT WA-000089-2
KAISER ALUMINUM FABRICATED PRODUCTS, LLC

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A - Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D - Response to Comments, an attachment to this fact sheet.

GENERAL INFORMATION	
Applicant:	Kaiser Aluminum Fabricated Products, LLC
Facility Name and Address:	Kaiser Aluminum Trentwood Works 15000 E Euclid Ave, Spokane Valley, WA 99215
Type of Facility:	Aluminum Casting and Forming
SIC Code:	3353
Discharge Location:	Waterbody name: Spokane River @ river mile 86.0 Latitude: 47° 41' 10" N, Longitude: 117° 13' 20" W.
Water Body ID Number:	WA-57-1010

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BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

Kaiser Aluminum Fabricated Products, LLC (KAFP) owns and operates an aluminum rolling mill and metal finishing plant at Trentwood, Spokane County, Washington (see Figure 1). The facility produces aluminum sheet, plate and coil through the rolling of aluminum with neat oils and emulsions. Supporting operations include direct chill casting and solution heat treating. Finished products are used mainly in the aerospace industry and for general engineering applications. The plant sits on 512 acres, with over 60 acres under roof.

The Trentwood facility was created in 1942 by the U. S. Government Defense Plant Corporation to produce aluminum for World War II aircraft. In 1946, Kaiser leased, then later purchased the facility. The Permittee has operated at the site since that time.

INDUSTRIAL PROCESS

Manufacturing operations include remelting and casting of aluminum to form ingots. The ingots are rolled on one or more of three hot rolling mills in series to form aluminum sheet, plate, or coil. Further thickness reductions for coil are accomplished on subsequent cold mills. Additional operations include annealing, inspection, sawing and final product packaging. The facility operates 24 hours per day, 7 days per week, with current employment of about 650 employees. The Permittee has added additional heat treatment capacity and plate stretching operations at the facility. Since the Trentwood location is not served by municipal sewers, a sanitary wastewater treatment plant serves the plant population.

The wastewater discharged from the facility consists of treated stormwater, process and sanitary effluent and groundwater. All stormwater, process and sanitary wastewater is routed through a 4-million gallon settling lagoon (equipped with oil skimming and collection equipment), filtered, then discharged to the Spokane River.

One process wastewater stream consists of oil and metal contaminated wastewater. An industrial wastewater treatment (IWT) plant treats this wastewater prior to discharge to the settling lagoon via internal Outfall #002. Influent to this system, which contains a nominal 5% emulsified oil, is treated by adding acid and steam to break the oil emulsion. The wastewater then flows to a series of oil/water separation tanks. Recovered oil is stored and then recycled off-site into a fuels program.

Wastewater from the oily wastewater treatment is routed to process tanks for further treatment. In the process tanks, additional free oil is removed via skimming. The wastewater then flows to a neutralization tank where aluminum and zinc ions are precipitated by the addition of lime to a pH of about 8.5.
From the neutralization tank, the wastewater discharges to a clarifier, which currently overflows to a mixed media filtration system. Backwash from the filtration system is returned to the process tanks while the filter effluent flows into the wastewater settling lagoon.

Solids from the clarifier are dewatered by a vacuum drum filter system, and the dewatered solids are shipped offsite for disposal.

Additional process wastewater streams are discharged to the wastewater lagoon via internal Outfalls #004 and 005 (north and south Outfalls, respectively). Both the south and north Outfalls discharge mostly non-contact cooling water to the wastewater lagoon. The wastewater lagoon also receives storm water runoff from approximately 60 acres of roof and other impervious areas

The sanitary wastewater treatment (SWT) plant includes primary settling, trickling filter treatment, secondary settling, and chlorination. Sludge is digested in a storage tank, then shipped off-site for disposal. The SWT effluent flows through internal Outfall 003 to the north Outfall and then into the wastewater lagoon.

All effluent from the wastewater lagoon is filtered by a black walnut shell (BWS) filtration system, prior to final discharge to the Spokane River via Outfall 001. The BWS filtration system was installed in 2003 to reduce PCBs discharged from the facility (see further discussion below). The backwash from this filter system is routed to the IWT clarifier.

Supply water for the operations is a withdrawn from the Spokane River and onsite groundwater wells. Currently, groundwater comprises about 60 percent of process water.

HISTORIC RELEASES/CLEAN UP ACTIVITIES

Several documented releases have occurred related to historical operations at the site. Kaiser has conducted independent investigations and remedial actions to address groundwater and soil contamination coming from these releases. Contamination included PCBs, petroleum product and metals in both soil and groundwater.

Since 1993, Kaiser has taken independent interim actions in the Oil House and Wastewater areas. These steps were taken to prevent the further movement of petroleum and PCBs floating on groundwater; prevent further movement of dissolved hydrocarbons in groundwater; recover petroleum product on groundwater; and enhance the breakdown of hydrocarbons.

As part of this effort, three pumping wells are used to lower ground water levels thereby enhancing contaminate capture and containment. One well is located at the Oil House and the other two are in the Wastewater Treatment area. Groundwater from the Oil House well and one Wastewater Treatment well are used as process water. Ground water from the other Wastewater Treatment area well generally exceeds process water demands, but serves as a backup source for other two wells. If not needed to meet process water demands, the excess groundwater is discharged through Outfall 001 after the BWS filters and prior to the effluent monitoring station.

On August 16, 2005, the Department and the Permittee entered into an agreed Order under the Model Toxics Control Act. The Order required the Permittee to perform a Remedial Investigation and Feasibility Study (RI/FS) at the site. The activities under this Order are ongoing.

DISCHARGE OUTFALL

Wastewater is discharged to the Spokane River at River Mile 86.0 via a submerged two port diffuser. The outfall is located approximately in the middle of the river channel.

PERMIT STATUS

The previous permit for this facility was issued in June, 1997. The permit expired in June 2002 and has been administratively extended since that time. The permit placed effluent limitations on selected internal Outfalls (002 and 003), and the final discharge to the river (Outfall 001).

The most recent application for permit renewal was submitted to the Department on November 17, 2005 and accepted by the Department on February 24, 2006. The permittee submitted modifications to the application on February 17, 2006, April 19, 2006, July 7, 2006, June 26, 2007 and May 20, 2009.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received an inspection on June 30, 2009. During the history of the permit, the Permittee has generally remained in compliance with effluent limitations in the current permit, based on Discharge Monitoring Reports (DMRs) submitted to the Department.

The Department has taken enforcement actions relating to the PCBs discharged from the facility to the Spokane River. Based on effluent sampling conducted in 2000 and 2001, which showed elevated PCBs in Outfall 001, Ecology issued an Agreed Order (No. 02WQER-3487) in January, 2002. This Order required the Permittee to prepare an engineering report to remove PCBs from the discharge; construct the treatment plant upgrades (by April 1, 2003); and begin routine monitoring for PCBs in the final effluent.

To comply with the Agreed Order, the Permittee designed and built the black walnut shell (BWS) filtration system to aid in removing PCBs from the process wastewater. In November and December, 2002 (prior to the BWS filter installation), effluent PCB monitoring showed significant PCB concentrations in Outfall 001.

In November, 2004, the Department issued a Penalty and Order based on the high PCB loadings discharged from the facility in 2002. This Order was amended in October, 2005 based on the appeal and subsequent settlement with the company. The amended Order required that the Permittee investigate the high levels of PCBs discharged in 2002, and identify and remove PCBs still remaining in the wastewater treatment and collection systems. Additionally, the Order required influent sampling to the BWS system to verify that the design PCB loadings to the filters were being maintained.

The Permittee has complied with requirement of both Orders. Work is ongoing in identifying and removing PCBs within the facility's wastewater treatment and collection systems. PCB monitoring and reporting requirements from both Orders will be incorporated into the proposed permit. These include the twice per month Outfall 001 monitoring (from 2002 Order); and influent flow and PCB monitoring to the BWS filtration system (from 2005 Order).

WASTEWATER CHARACTERIZATION

Table 1 lists effluent and river intake monitoring data from January, 2004 to June, 2005. During this time, effluent flow discharged to the Spokane River (Outfall 001) averaged about 15.7 million gallons per day.

Of this, about 7.7 mgd is excess ground water discharged through Outfall 001. Internal flows at Outfalls 002 (industrial wastewater) and 003 (sanitary wastewater) averaged 68,000 and 41,000 gallons per day, respectively.

Whole effluent toxicity testing conducted as part of the permit application showed no acute or chronic toxicity in Outfall #001 effluent. Effluent priority pollutant scan detected no volatile, semi-volatile, or pesticides in the Outfall #001 effluent. Supplemental testing showed no mercury in the final effluent at 1 ng/L.

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent**.** Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation**.** Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria. The design criteria the BWS filters are taken from engineering report (CDM, 2002) and are as follows:

Parameter	**Design Quantity**
Daily Maximum Flow	11.0 MGD
Influent Total PCB Loading	0.78 g/day

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

The technology-based limitations for aluminum forming are based on Best Available Technology (BAT) limits for toxic and nonconventional pollutants; and Best Conventional Technology (BCT) limits for conventional pollutants. For Aluminum Forming, BCT limits have not been promulgated. Therefore, Best Practical Technology (BPT) limits were assumed equal to BCT. New Source Performance Standards (NSPS) were applied to the expanded horizontal heat treat production. These limitations were developed by the Environmental Protection Agency (EPA), and are found in the Code of Federal Regulations (CFR), current as of September 14, 2006 as follows:

Subcategory	Technology
Rolling with Neat Oils (40 CFR 467, Subpart A, Core without an annealing furnace scrubber)	BAT/BCT
Rolling with Emulsions (40 CFR 467, Subpart B, Core)	BAT/BCT
Rolling with Neat Oils (40 CFR 467, Subpart A, Solution Heat Treating Contact Cooling Water)	BAT/BCT
Rolling with Emulsions (40 CFR Part 467, Subpart B, Direct Chill Casting Contact Cooling Water)	BAT/BCT
Rolling with Emulsions (40 CFR Part 467, Subpart B, Solution Heat Treating Contact Cooling Water)	BAT/BCT & NSPS

The Permittee also generates non-scope wastewaters (those wastewater generated from processes not covered under the effluent guidelines). Guidance for setting discharge limits for non-scope wastewater is provided by amendments to the original publication of the Development Document for the Aluminum Forming Point Source Category. The amendments with corresponding explanation were published in the Federal Register (Vol. 53, No. 248, December 27, 1988).

These technology based limits differ from those developed in the previous fact sheet, because the facility no longer performs certain operations at the site (coil manufacture, coil rinsing and coating, and rod milling).

Limits associated with Aluminum Forming are determined from pounds of product produced. Production data are based on data taken from the permit application during the time from April, 2004 to August, 2005 (highest daily production during a one calendar month period). For the expanded horizontal heat treat operations, production was estimated. Table 2 lists the production values used to calculate technology based limits.

At the Industrial Wastewater Treatment (IWT) plant (Outfall 002), applicable subcategories (i.e. building blocks) included Rolling with Neat Oils (Core) and Rolling with Emulsions (Core).

Calculated technology based limitations for this internal outfall are detailed in Table 3 and are summarized below:

Outfall 002 (IWT)		
Pollutant	**Daily Maximum**	**Daily Average**
Chromium, lbs/day	1.36	0.57
Cyanide, lbs/day	0.91	0.38
Zinc, lbs/day	4.54	1.89
Aluminum, lbs/day	20.1	9.93
Oil and Grease, lbs/day	62.1	37.23
TSS, lbs/day	127.2	60.4
pH, s.u.	within the range 7.0 – 10.0	

For wastewater discharged directly into the wastewater lagoon (via the north and south Outfalls), building blocks include Rolling with Neat Oils (Solution Heat Treatment Contact Cooling Water) and Rolling with Emulsions (Direct Chill Casting Contact Cooling Water and Solution Heat Treatment Contact Cooling Water). Additionally, since the majority of the wastewater discharge to the wastewater lagoon is non-scope wastewater, allowance for non-scope discharge is also applicable.

The guidance for setting discharge limits for non-scope wastewater states that the discharge limits should be determined from the product of the wastewater flow rate and treatment limits as given in Section VII of the Development Document. The resulting quantity can then be added to other process wastewater building blocks to determine the total mass discharge limit.

The estimated average non-scope wastewater flow rate is 6.72 mgd. One day maximum and thirty day average treatment limits for lime settling and filtration (LS&F) provided in Table VII-20, Section VII of the Development Document were used in determining the non-scope allowances. The treatment limits were then multiplied by the average flow rate to give the allowable non-scope mass discharge limits. These limits were added the process wastewater building blocks the total allowable mass discharge limits (Tables 4 and 5). The resulting technology based effluent limits for process wastewater discharged from Outfall 006 are summarized below:

Process Wastewater in Outfall 006		
Pollutant	**Daily Maximum**	**Daily Average**
Chromium, lbs/day	22.7	6.4
Cyanide, lbs/day	1.27	0.53
Zinc, lbs/day	63.5	20.0
Aluminum, lbs/day	372.2	149.5
Oil and Grease, lbs/day	710.5	655.1

Process Wastewater in Outfall 006		
Pollutant	**Daily Maximum**	**Daily Average**
TSS, lbs/day	1142.1	709.4
pH, s.u.	within the range 7.0 – 10.0	

The above effluent limits for chromium and aluminum are much higher than the current permit limit for these parameters. The permittee is able to meet the current limitations for chromium and aluminum. Therefore, the proposed limits for chromium and aluminum will be set at present permit levels.

Additionally, the proposed permit allows the permittee to calculate discharge quantities of chromium, aluminum, oil & grease, and TSS on a net basis, by subtracting plant intake water loadings from Outfall 006 loadings. The facility withdraws about 40% of the plant's process supply water from the Spokane River. The Spokane River oftentimes contains detectable amounts of chromium, aluminum, oil and grease and TSS. Federal rules in 40 CFR Part 122.45(g) provide two circumstances where technology-based effluent limitations may be credited for pollutants in the discharger's intake water. One of these conditions includes where the applicable effluent limitations and standards contained in 40 CFR subchapter N specifically provide that they shall be applied on a net basis.

The federal rule also places further conditions on granting intake water credits. For BOD and TSS, the credit should not be given unless the permittee demonstrates that the constituents of the generic measure in the effluent are substantially similar to the constituents in the generic measure in the intake water. The facility had previously demonstrated this similarity during a previous permit renewal.

For the Permittee's sanitary wastewater, municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater. Based on best professional judgment, the proposed permit will not contain the percent removal requirements for TSS and BOD_s because of the dilute nature of the Permittee's sanitary wastewater.

Federal regulations found in 40 CFR part 133.103(d) allow substitution of a mass loading limit for percent removal requirements for less concentrated influent wastewater for separate sewers; provided the following conditions are met: the treatment works is consistently meeting its permit effluent concentration; to meet the percent removal requirements, the treatment works would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards; and the less concentrated influent wastewater is not the result of excessive infiltration and inflow. The sanitary treatment plant meets all these conditions.

The following technology-based limits for pH, fecal coliform, BOD_s, and TSS are taken from Chapter 173-221 WAC are:

Outfall 003 (Sanitary Wastewater)		
Pollutant	**Daily Average**	**Weekly Average**
pH, s.u.	within the range 6.0 – 9.0	
BOD_5, mg/L	30	45
TSS, mg/L	30	45
Fecal Coliform Bacteria, #/100ml	200	400

Corresponding BOD_5 and TSS loadings, in pounds per day, have been included in the proposed permit based on a limiting design flow through the secondary clarifier of 192,000 gpd (CH2M Engineers, 1970).

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the water body's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses. The critical condition for the pollutants in this discharge is during the summertime low flow season.

MIXING ZONES

This permit authorizes an acute and a chronic mixing zone around the point of discharge as allowed by Chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The Water Quality Standards stipulate some criteria be met before a mixing zone is allowed. Table 6 summarizes these requirements and Ecology's actions in the proposed permit.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Spokane River which has the following use designations (Table 602 of Chapter 173-201A): aquatic life uses (salmonid spawning, rearing, migration); primary contact recreation; water supply uses (domestic, industrial, agricultural, stock); and miscellaneous uses (wildlife habitat, harvesting, commerce/navigation, boating, aesthetics). Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

The Spokane River basin encompasses over 6,000 square miles in Washington and Idaho. The Spokane River begins at the outlet of Lake Coeur d'Alene and flows west 112 statute miles to the Columbia River. The river flows through the cities of Post Falls and Coeur d'Alene in Idaho, and through the large urban areas of Spokane and Spokane Valley.

Other cities in the basin include Wallace and Kellogg, upstream from Lake Coeur d'Alene, and Liberty Lake, Deer Park, and Medical Lake.

The flow regime for the Spokane River is dictated largely by freezing temperatures in the winter followed by summer snowmelt. The annual harmonic mean flow is approximately 2,154 cfs as the river crosses the Idaho border. Flow increases to 2,896 cfs downstream of Spokane, reflecting the influx of groundwater through this river reach.

In Idaho, other point source outfalls to the Spokane River include the City of Coeur d'Alene, Hayden Area Regional Sewer Board POTW, and the City of Post Falls POTW. In Washington, points sources include Liberty Lake POTW (upstream from the Permittee), and Inland Empire Paper Company and the City of Spokane AWTP (downstream from the Permittee).

Significant nearby non-point sources of pollutants to the Spokane River include stormwater and combined sewer overflows from the City of Spokane; and sources from Latah Creek (or Hangman Creek), Little Spokane River and Coulee/Deep Creeks.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic life, recreation, and water supply uses. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	must not exceed a geometric mean value of 100 colonies /100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies /100 mL
Dissolved Oxygen	8 mg/L (lowest one day minimum)
Total Dissolved Gas	shall not exceed 110 percent of saturation at any point of sample collection
Temperature	7-DADMax (7-day average of the daily maximum temperatures) of 17.5°C (63.5°F)
pH	within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units
Turbidity	5 NTU over background when the background is 50 NTU or less; or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

Two other special conditions apply to the Spokane River. From Nine Mile Bridge (river mile 58.0) to the Idaho Border (river mile 96.5), temperature shall not exceed a 1 day maximum (1-DMax) of 20.0°C due to human activities.

When natural condition exceed a 1-DMax of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases at any time exceed t=34/(T+9); "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

In addition, from Long Lake Dam (river mile 33.9) to Nine Mile Bridge (river mile 58.0), the average euphotic zone concentration of total phosphorus (as P) shall not exceed 25 ug/L during the period of June 1 to October 31.

In 1989, the Spokane River Phosphorus Management Plan was adopted to meet the above total phosphorus standard. This plan set total phosphorus limits for each point source discharger to the Spokane River. Under the current plan, two industrial dischargers (the Permittee and Inland Empire Paper Company) are given a monthly average aggregate limit (industrial bubble limit) and a specific individual limit. Under this scenario, one discharger would not have a permit violation of their individual limit as long as the industrial bubble limit is met. The industrial bubble limit is 16.55 kg per day (36.4 pounds per day) while Kaiser Aluminum's limit is 5.35 kg per day (11.7 pounds per day). These current limits only apply during the algal growing season (June 1 to October 31).

The Department routinely assesses available water quality data on a statewide basis. The results are submitted to the Environmental Protection Agency (EPA) as an "integrated report" to satisfy Sections 303(d) and 305(b) of the federal Clean Water Act. This report lists water quality for a particular location in one of five categories, as recommended by EPA. Categories one through four represent the 305(b) Report which is the overall status of water quality in the State. Category 5 represents waters on the 303(d) list which are the known polluted waters in the State.

A total daily maximum load (TMDL) must be developed for each water body on the 303(d) list. The purpose of a TMDL is to determine the amount of pollution a water body can receive while still meeting water quality standards. Maximum allowable pollution from various sources are established as either individual waste load allocations (WLAs) for points sources or load allocations (LAs) for nonpoint sources.

For the Spokane River, multiple segments are on the Department's 2004 303(d) list. Water quality is not meeting standards for: dissolved oxygen, temperature, dissolved gas, fecal coliform bacteria, total PCBs, and dioxin. There is a draft TMDL report that addresses the total PCBs listings in the Spokane River. There are not yet TMDLs prepared for the temperature, dissolved gas, fecal coliform bacteria, and dioxin listings.

In the 305(b) Report, the Spokane River also includes category 1, 2, and 4a waters. Category 1 waters are where standards are being met; category 2 waters are where the data are not sufficient for listing as impaired, but there still may be a concern about water quality; and category 4a is for waterbodies that have an approved TMDL. There have been approved TMDLs for metals (cadmium, lead and zinc) and total phosphorus (as discussed above) on the Spokane River.

For dissolved oxygen, the Department prepared a draft TMDL report for the Spokane River and Lake Spokane in 2004 (Ecology, 2004); and finalized this TMDL 2009 (Ecology, 2009). EPA approved the TMDL on May 20, 2010.

The approved TMDL uses a modeling approach that includes the contributions from both stormwater and point sources in Idaho; and accounts for dissolved oxygen impacts caused by operation of Long Lake Dam during the most critical times of the year.

For point and nonpoint sources, the TMDL recommends reductions in phosphorus, carboneous biological oxygen demand (CBOD), and ammonia discharged to the Spokane River necessary to meet the dissolved oxygen water quality standard in Lake Spokane. These reductions apply during an expanded critical season (March through October).

As a result of the 2004 draft report, Ecology, NPDES point source dischargers, and other interested parties formed the Spokane River Collaboration to cooperatively address the low dissolved oxygen concentrations in the Spokane River. This effort culminated in a Foundational Concepts document that outlines actions necessary to reduce phosphorus discharged to the river.

While parts of this document are now dated due to the new modeling approach used for the approved TMDL, the Department will use some elements of the Foundational Concepts to implement the TMDL. This fact sheet discusses the portions of the Foundational Concepts applicable to this discharger in the next section below.

The Department has also completed a draft Total Maximum Daily Load (TMDL) assessment for PCBs in the Spokane River (Ecology, 2006). The proposed TMDL is based on meeting a downstream Spokane Tribe water quality PCB criterion of 3.37 pg/l. This requires a 95% PCB load reduction at the Idaho border, a 97% load reduction in the Little Spokane River, and over a 99% reduction in municipal, industrial, and stormwater discharges.

The Spokane River regularly also violates water quality criteria for zinc. Criteria for lead and cadmium are also frequently exceeded, especially at higher flows. In 1999, the Spokane River Metals TMDL was completed to address these water quality exceedences (Ecology, 1999). Specific WLAs applicable to the Permittee are discussed in the next section below.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. Mixing zones are authorized as noted above and are discussed below.

The dilution factors of effluent to receiving water that occur within the mixing zones have been determined at the critical condition by the use of a dye study. This study indicates that dilutions based on percentage of river flow are more restrictive than dilutions based on downstream distances from the diffuser.

The critical condition for the Spokane River is the seven day average low river flow with a recurrence interval of ten years (7Q10). This value was estimated at the Permittee's point of discharge by calculating the 7Q10 at the USGS river monitoring station at Liberty Lake (Harvard Road) of 115 cfs, then by adding an estimated groundwater recharge to the river between this station and the Permittee's discharge of 395 cfs (Ecology, 2006). This results in a 7Q10 at the Permittee's discharge of 510 cfs.

The criteria dilution factors will be calculated using a percentage of this 7Q10 river flow, and the historic daily maximum and monthly average flowrates from January, 2004 and June, 2006, as follows:

	Acute (2.5% of 7Q10)	Chronic (25% of 7Q10)
Effluent Flow, MGD	20.96 (daily maximum)	16.94 (monthly maximum)
Dilution Factor	1.39 (71.8% effluent)	5.86 (17.1% effluent)

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as total phosphorus and BOD are a far-field pollutants whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water. Ambient data at critical conditions in the vicinity of the outfall were taken from the Permittee's monitoring of river intake water. The ambient background data used for this permit includes the following:

Parameter	**Value used**
7Q10 low flow	510 cfs
Temperature[a]	19.2°C (66.5°F)
pH[b] (high)	7.9
pH[b] (low)	6.9
Hardness[a]	36 mg/L as $CaCO_3$
Alkalinity[c]	50 mg/L as $CaCO_3$
Total Chromium[d]	0.17 µg/L
Aluminum	assumed zero
[a]The 90th percentile (high) for temperature and the 10th percentile (low) value for hardness from the Permittee's monitoring of river intake water from July, 2004 through October, 2004.	
[b]The 90th percentile (high) and 10th percentile (low) pH values measured from Ecology's long term monitoring site on the Spokane River at Stateline.	
[c]Approximate lowest alkalinity measured during summer season at Ecology's long term monitoring site on the Spokane River at Riverside State Park.	
[d]The 90th percentile (high) values measured from Ecology's long term monitoring site on the Spokane River at Stateline.	

The impacts of dissolved oxygen deficiency, temperature, pH, metals, and other toxics are discussed below.

BOD_5, Ammonia, and Total Phosphorus - The Spokane River and Lake Spokane (Long Lake) dissolved oxygen TMDL report sets WLAs for total phosphorus, CBOD, and ammonia for each NPDES discharger to the Spokane River. The proposed permit sets interim limits and establishes a compliance schedule for meeting the water quality based effluent limits (WQBELs) for these three parameters.

The Foundational Concepts spreads this approach over a twenty year managed implementation plan (MIP). During the first ten years of the MIP, dischargers will focus efforts to reduce phosphorus discharged to the Spokane River. Permittees would accomplish these reductions by a combination of phosphorus treatment technology and other target pursuit actions.

As part of the TMDL process, the Department will form an oversight and coordination group consisting of dischargers and other interested stakeholders. This group will oversee and coordinate non-point source control, monitoring, modeling, reporting, and public outreach. In other words, this group will monitor and track all aspects of the TMDL.

The proposed permit sets interim water quality based effluent limits based on best information from the Spokane River and Lake Spokane TMDL. During the first 10 years, the TMDL oversight and coordination group will gather additional effluent and environmental data associated with the low dissolved oxygen (DO) levels in the Spokane River. This new data may change these WLAs. If necessary and appropriate, the Department will revise the TMDL and set new WQBELs based on this new information. An adjustment of the final effluent limitations resulting in less stringent limitations is subject to the provisions of the Clean Water Act for deriving limitations in section 303(d)(4)(A), 42 U.S.C. § 1313(d)(4)(A); and the anti-backsliding provisions of the Clean Water Act, including the exceptions in section 402(o)(2) of the Clean Water Act, 33 U.S.C. § 1342(o)(2).

The Department anticipates the following schedule of actions during the first and second 10 year periods of the managed implementation plan:

<table>
<tr><td rowspan="2"></td><td colspan="4">NPDES Permit Cycle</td></tr>
<tr><td>I</td><td>II</td><td>III</td><td>IV</td></tr>
<tr><td>Years:</td><td>0-5
(2011-2016)</td><td>6-10
(2016-2021)</td><td>11-15
(2021-2026)</td><td>16-20
(2026-2031)</td></tr>
<tr><td rowspan="2">NPDES Permit Requirements During Cycle</td><td>Start, continue, and/or complete target pursuit actions.</td><td>Start or continue, and complete target pursuit actions, including implementation of technology and Delta Elimination actions.</td><td colspan="2">Continue target pursuit actions. Implement any modifications to technology and Delta Elimination actions.</td></tr>
<tr><td colspan="2">Interim performance based limits; best management practices (BMPs) plan.</td><td colspan="2">-</td></tr>
</table>

	NPDES Permit Cycle			
	I	II	III	IV
Years:	0-5 (2011-2016)	6-**10** (2016-**2021**)	11-15 (2021-2026)	16-**20** (2026-**2031**)
	By Year 10 - Final wasteload allocation: effluent data + delta elimination = 3.21 lbs/day (25 µg/L @ 15.4 mgd) total phosphorus with possible modifications based on new information.		Wasteload allocation: same as year 10 with possible modifications based on new information. Ecology may re-express the final WQBELs as daily maximum, monthly average, or seasonal total as determined appropriate and consistent with the seasonal average WLAs.	
Avista (Long Lake Dam)	Develop water quality attainment plan (WQAP) within two years following EPA approval of TMDL (2012)	Assess performance in improving dissolved oxygen based on milestones identified in WQAP by 2020.	Continue to implement actions identified in WQAP.	Assess performance in 2030.
Continuous Actions	Monitoring / Assessment , Non-point source reductions by others*			

In this permit, the Department's approach for meeting the WLAs and WQBELs mirror the Foundational Concepts document for point source dischargers. The proposed permit requires reductions in the total phosphorus, CBOD, and ammonia discharged to the Spokane River, through a combination of treatment technology and other target pursuit actions.

State and Federal law require NPDES permit contain water quality based effluent limits for all applicable parameters, and State law limits compliance schedules necessary to meet water quality based effluent limits to no longer than 10 years (unless a longer compliance schedule becomes available under RCW 90.48.605).

The compliance schedules for total phosphorus, CBOD, and ammonia are based on the actions described for phosphorus in the Foundational Concepts document. For the first five year permit cycle, this includes a schedule to meet the interim and WQBELs; and the obligation to start, continue, and/or complete certain target pursuit actions as described below.

- *Technology Selection Protocol*: NPDES permit holders will prepare, and submit to Ecology for approval, a comprehensive technology selection protocol for choosing the most effective feasible technology for seasonally removing phosphorus, CBOD, and ammonia from their effluent. If pilot testing is a part of the protocol, there will be appropriate provisions for quality assurance and control. The protocol will include a preliminary schedule for construction of the treatment technology.

- *Delta Elimination Plan*: A dischargers' Delta is the actual pounds of phosphorus, CBOD, or ammonia discharged per day after the implementation of the most effective feasible technology minus the WLA target pounds. A discharger will complete a planned and scheduled group of actions aimed at eliminating their Delta. These actions will be outlined in a Delta Elimination Plan.

The Delta Elimination Plan will include a schedule for other phosphorus, CBOD, and ammonia removal actions such as conservation, effluent re-use, source control through support of regional phosphorus, CBOD, and ammonia reduction efforts (such as limiting use of fertilizers and dishwasher detergents), and supporting regional non-point source control efforts to be established. The plan, in combination with the pollutant reduction from technology, will provide reasonable assurance of meeting the permit holder's WLAs in ten years (2020).

- *Engineering Report*: After a permit holder implements the Technology Selection Protocol, the permit holder will prepare, and submit to Ecology for approval, an Engineering Report concerning the chosen technology, including any updates to the construction schedule.

  The Engineering Report will also (if necessary) be accompanied by amendments to the schedule and substance of the target pursuit actions (i.e. Delta Elimination) so that in combination with the expected technology performance, there is reasonable assurance of meeting the WLAs in ten years (2020).

- *Water Quality Based Limits*: The proposed permit sets WQBELs based on the wasteload allocations in the Spokane River and Lake Spokane dissolved oxygen TMDL. The TMDL gives wasteload allocations to Kaiser Aluminum for ammonia, total phosphorus, and CBOD as seasonal average values from March through October as shown below:

Point Source Discharge	2027 Projected Flow Rates (MGD)[1]	NH_3		TP		$CBOD_5$[2]	
			WLA		WLA		WLA
		mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day
Kaiser	15.4	0.07	9.0	0.025	3.21	3.6	462.7

[1]Actual, not projected flows, will determine compliance with wasteload allocations in NPDES permits.
[2]NPDES permit limits will use $CBOD_5$ (as shown) rather than $CBOD_{ult}$ as modeled.

40 CFR Part 122.45(d) specifies NPDES industrial permits express effluent limits as either daily maximum or monthly average values, unless impracticable. At this time, the Department believes converting the seasonal wasteload allocations into daily maximum/monthly average limits is impracticable for the following reasons:

1) Effluent variability from the not-yet-installed treatment technology is not known. In order to convert a seasonal average (i.e. long term average) into daily maximum and monthly average limits, the Department needs a measure of how pollutant concentrations vary in the effluent (coefficient of variation). Converting long term average values into limits also depends on the type of the data distribution (normal, log-normal, etc.). The Department will not know this information until after the Permittee collects enough effluent data from the installed treatment technology.

2) The dissolved oxygen in Lake Spokane depends on season long loadings, and does not appreciably vary with daily fluctuations in effluent concentrations. The nutrients discharged to the Spokane River from point and nonpoint sources cause aquatic plant growth (termed eutrophication). This plant growth may reduce the oxygen in the water to levels that are harmful for fish and other aquatic species.

Aquatic plants reduce dissolved oxygen levels in a water body in two ways: during the night when they respire and consume oxygen and when they decompose and natural biological processes consume oxygen.

The eutrophication and aquatic plant decomposition processes and resulting dissolved oxygen sags in Lake Spokane are a season long occurrence, dependent most on seasonal average pollutant loadings. These processes are insensitive to the daily variations in effluent concentrations discharged from point sources. Therefore, the Department is concerned with the average pollutant loadings through the critical period (March to October).

The proposed permit will contain WQBELs expressed identical to the WLAs in the Spokane River DO TMDL (seasonal average loads). At the end of the second permit term, the Department will have sufficient data to determine effluent variability from the installed treatment technology. At this time, the Department may include daily maximum, monthly average, or seasonal total loads as the final WQBELs; as determined appropriate and consistent with the seasonal average WLAs.

The Department will determine compliance with the WQBELs by effluent data combined with any credits from the Delta Elimination Plan. The proposed compliance schedule is shown below (Permit Condition S8.):

Target Pursuit Action	Compliance Date
Annual Status Reports	February 1st of each year
Delta Elimination Plan	Two (2) years after permit effective date
Technology Selection Protocol for Treatment Technology	Two (2) years after permit effective date
Engineering Report for Treatment Technology	Three (3) years after permit effective date
Phosphorus Treatment Technology	Must be installed and operational within Five (5) years after permit effective date
Meet Final Water Quality Based Effluent Limits	Ten (10) years after permit effective date

The interim limitations for phosphorus, CBOD, and ammonia in the proposed permit include both numeric effluent limitations (phosphorus) and best management practices (BMPs). Federal regulations (40 CFR Part 122.44(k)) allow the use of BMPs to 'control and abate pollution' when numeric limitations are infeasible. In this case, the Department does not have sufficient data to establish numeric effluent limits for both CBOD and ammonia. The purpose of these interim limitations are to hold the discharge to existing phosphorus, CBOD, and ammonia levels during the critical time period (i.e. no increase in loading).

The performance based phosphorus interim limit was set by examining the total phosphorus discharged from the internal Outfalls 002 and 003 from January, 2004 to June, 2005. A daily maximum limit was set at the highest observed value (2.9 lbs/day).

A monthly average value was set at the mean loading plus two standard deviations (0.54 + 2*0.37 = 1.3 lbs/day). This limitation will apply only during the critical time period (April through October); and replace the previous total phosphorus limits which were based on the Spokane River Phosphorus Management Plan.
This interim phosphorus limits for the internal Outfalls 002 and 003 are close to the final WLA for phosphorus. However, the loading from these outfalls do not reflect the total phosphorus discharged from the facility.

Based on data collected by the Permittee in early 2007, high volumes of the contact and noncontact cooling water from internal Outfalls 004 and 005 carry a sizable phosphorus load (See Figure 2 for a summary of these internal flows and phosphorus loadings). Therefore, the Department believes the proposed compliance schedule is necessary and reasonable.

The BMP plan for phosphorus, CBOD, and ammonia is outlined in Permit Condition S4. The goal of the BMP plan is to maintain, or lower these pollutants in the effluent by use of pollution prevention and wastewater reduction opportunities. The proposed permit requires that this plan be updated annually.

Total PCBs - The draft PCB TMDL report assigns a WLA for Kaiser Aluminum of 0.32 mg/day (5.32 pg/L at 15.8 mgd). Since the TMDL is still draft, and has not been approved by the EPA, this WLA will not be included in the proposed permit. Rather, continued PCB monitoring, source identification and cleanup activities will be required at the site, as required by this permit and the Water Quality Administrative Orders discussed previously.

Metals (Lead, Cadmium, and Zinc) - The Spokane River dissolved metals waste load allocation is based on the most restrictive permit limits derived by either meeting aquatic life toxicity criteria at effluent hardness at the end-of pipe, or based on maintaining existing concentrations of metals in effluent using performance based limits with an added 10 percent compliance buffer. Whichever method results in the lower limit will be selected for the permit limit and established as the wasteload allocation.

The Permittee withdraws a portion of their supply water from the Spokane River. The levels of lead, cadmium, and zinc in the intake water complicate the development of performance based limits for these parameters. For example, many times the zinc concentrations in the intake water at the facility are higher than those discharged. For this reason, the proposed permit will set limits based on criteria based on end-of-pipe hardness.

These criteria values were calculated using the 10^{th} percentile end-of-pipe hardness (133 mg/L as $CaCO_3$), as recommended by the TMDL. The resulting limits are as follows:

	Criteria (end-of-pipe)	
Metal	**Monthly Avg**	**Daily Max**
Cadmium, ug/L	1.2	2.1
Lead, ug/L	3.4	5.9
Zinc, ug/L	73	146

Temperature and pH - The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were chronic dilution factor 5.86, upstream temperature 69.6 °F, upstream minimum pH of 6.8, upstream maximum pH of 8.1, upstream alkalinity 50 (as mg/L as $CaCO_3$), effluent temperature 71.5 °F, effluent minimum pH of 6, effluent maximum pH of 9, and effluent alkalinity 50 (as mg/L as $CaCO_3$).

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the previous limits for pH (within the range 6.0 to 9.0) were placed in the permit.

Toxic Pollutants - Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge (which have not already been discussed above): aluminum and chromium. Both these parameters are limited under technology based standards, a reasonable potential analysis (See Appendix C) was conducted to determine whether or not the technology based effluent limitations would violate receiving water quality criteria.

The determination of the reasonable potential for aluminum and chromium to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs during the summertime low river flows. The parameters used in the critical condition modeling are as follows: acute dilution factor 1.39, chronic dilution factor 5.86, receiving water and effluent critical hardness of 133 and 40, mg/L as $CaCO_3$, respectively. Effluent concentrations were estimated based on proposed effluent limitations converted to concentrations using a minimum observed flow of 9.33 mgd during the time from January, 2004 to June, 2005.

Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests. Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC_{50}, $EC_{50,}$ IC_{25}, etc.

All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

An effluent characterization for acute and chronic toxicity was conducted during a previous permit term. In accordance with WAC 173-205-060, the proposed permit will require the Permittee to repeat this effluent characterization because of the changes in both plant processes and production.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge does not contain chemicals of concern (other than PCBs) based on existing effluent monitoring data, and data from permit application testing. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Spokane River in the vicinity of the discharge is not an area of sediment deposition. However, there are depositional areas downstream from the Permittee in the vicinity of Upriver Dam (at river mile 79.9). Currently, the Department and Avista Development, Inc. are cleaning up Spokane River sediments at the Upriver Dam PCBs Sediments Site.

This cleanup site is divided into two projects. Deposit 1 begins directly behind Upriver Dam in the City of Spokane and continues east for approximately 3.6 acres. Deposit 2 is a small 0.25-acre area near Donkey Island in an unincorporated area. The Permittee was named a potentially liable party for the contamination, along with others. The Permittee participated in this cleanup through a separate agreement with Avista Development, Inc.

The Department has been unable to determine at this time the continued potential for this discharge to cause a violation of sediment quality standards. If the Department determines in the future that there is a potential for violation of the Sediment Quality Standards, an order will be issued to require the Permittee to demonstrate that there is not an accumulation of toxics in Spokane River sediments.

PROPOSED PERMIT LIMITS/COMPARISON WITH PREVIOUS PERMIT LIMITS

Table 7 compares technology based effluent limitations for Outfalls 002 and 001 to previous permit limitations. The proposed permit will also change the point of compliance for process wastewater monitoring. In the previous permit, effluent sampling occurred at the final discharge, which is a mixture of groundwater and treated process wastewater. In the proposed permit, technology based limitations will be measured at the BWS effluent (Outfall 006); while water quality based limits will be set at the final discharge (Outfall 001 - BWS effluent plus groundwater).

For Outfall 002, proposed permit limits are more restrictive than the previous limits for chromium, aluminum, oil and grease, and TSS. The proposed permit limits are slightly less restrictive for cyanide and zinc. This is due to the both the different production and effluent guideline categories used to calculate these technology based limits. The previous permit contained technology based limits for both ortho-phosphate and hexavalent chromium. Since the current production categories do not regulate these parameters, they will be removed from the proposed permit.

For process wastewater (Outfall 006), the technology based limits calculated above for aluminum and chromium are much greater than current permit limits. Therefore, as discussed previously, limits for these parameters will be set current permit levels. The proposed permit has more restrictive process wastewater limits for cyanide, oil and grease, and TSS. This is due again to the different production and guidelines used to calculate these limits.

Ecology calculated mass limits for BOD_5 and TSS limits for Outfall 003 using a limiting design flow for the secondary clarifier of 192,000 gpd (CH2M Engineers, 1970). The previous permit used a flow of 250,000 gpd to calculate BOD and TSS mass limits.

As discussed previously, Section 402(o) of the Clean Water Act generally prohibits relaxing effluent limits in reissued permits. This applies to case-by-case technology based limits when less stringent guidelines are promulgated later; and to limits based on State Standards. There are exceptions to these antibacksliding provisions. One exception (in Section 402(o)(2) of the Act) includes when material and substantial alterations or additions to the permitted facility have occurred after permit issuance.

The Department believes that the antibacksliding requirements do not apply to the less stringent limits at Outfall 002 for cyanide and zinc; and the removal of limits at Outfall 002 for ortho-phosphate and hexavalent chromium. This is because there have been significant alterations to the facility which justify the application of these less stringent effluent limitations. However, antibacksliding will apply in the future to the case-by-case technology based limits set at Outfall 006 for aluminum and chromium.

Outfall 001 contains WLAs for zinc, lead and cadmium based on the Spokane River Metals TMDL. The proposed permit also contains an interim phosphorus limit for combined Outfalls 002 and 003 based on past performance history, and best managements practices (BMPs) for total phosphorus, CBOD, and ammonia.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved. Monitoring for carboneous biological oxygen demand (CBOD) and ammonia (other pollutants specified by the Spokane River Total Phosphorus/DO TMDL) will also be required.

Ecology and the Spokane River dischargers have funded a study to determine the biologically available total phosphorus in the wastewater effluent. The DO TMDL assumed 100% of the total phosphorus is bioavailable. Preliminary results of this study indicates the total phosphorus available for aquatic plant growth is less than 100%.

Water Environment Research Foundation and CH2M-Hill studies have indicated that the digestion step of the total phosphorus analysis introduces compounds that interfere with a reliable, reproducible result. Successful compliance monitoring will require reliable, reproducible results. Based on the above study results, total reactive phosphorus may be such an analysis.

Therefore, the proposed permit requires testing for total reactive phosphorus in addition to the monitoring for total phosphorus.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

EFFLUENT LIMITS BELOW QUANTITATION

The water quality-based effluent limits for lead and cadmium in the wastewater are near the capability of current analytical technology to quantify. The Quantitation Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the Quantitation Level, the Permittee reports NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for: BOD_5, dissolved oxygen, pH, hexane extractable materials (oil and grease), TSS, total phosphorus, orthophosphate, aluminum, zinc, chromium and fecal coliform.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

NON-ROUTINE AND UNANTICIPATED DISCHARGES

Occasionally, this facility may generate wastewater which is not characterized in their permit application because it is not a routine discharge and was not anticipated at the time of application. These typically are waters used to pressure test storage tanks or fire water systems or leaks from drinking water systems. These are typically clean waste waters but may be contaminated with pollutants. The permit contains an authorization for non-routine and unanticipated discharges. The permit requires a characterization of these waste waters for pollutants and examination of the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and opportunities for reuse, Ecology may authorize a direct discharge via the process wastewater outfall or through a stormwater outfall for clean water, require the wastewater to be placed through the facilities wastewater treatment process or require the water to be reused.

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

TREATMENT SYSTEM OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An operation and maintenance manual was submitted as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for 5 years.

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Permit and Wastewater Related Information
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FIGURES AND TABLES

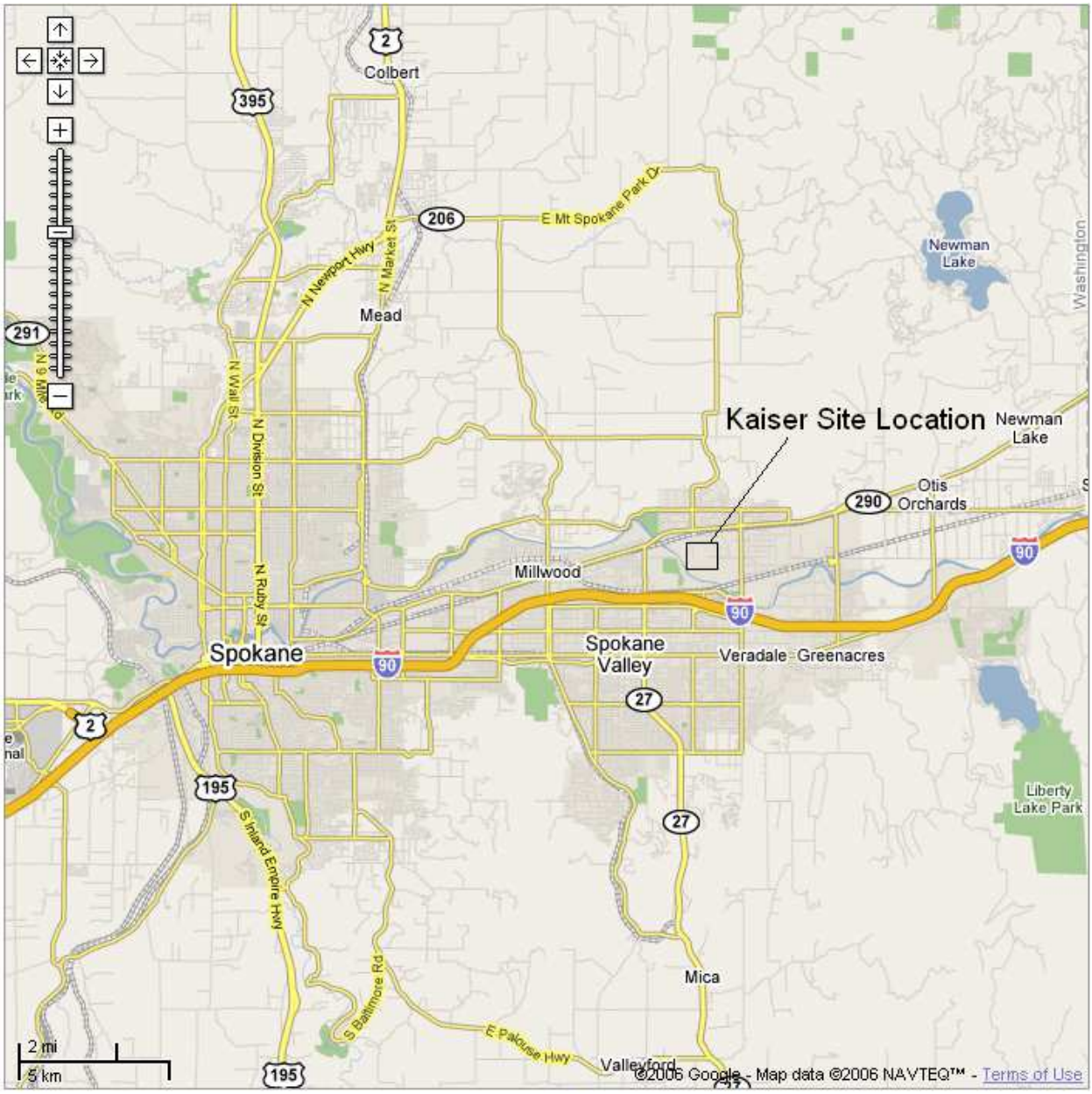

Figure 1: Kaiser Aluminum Site Location

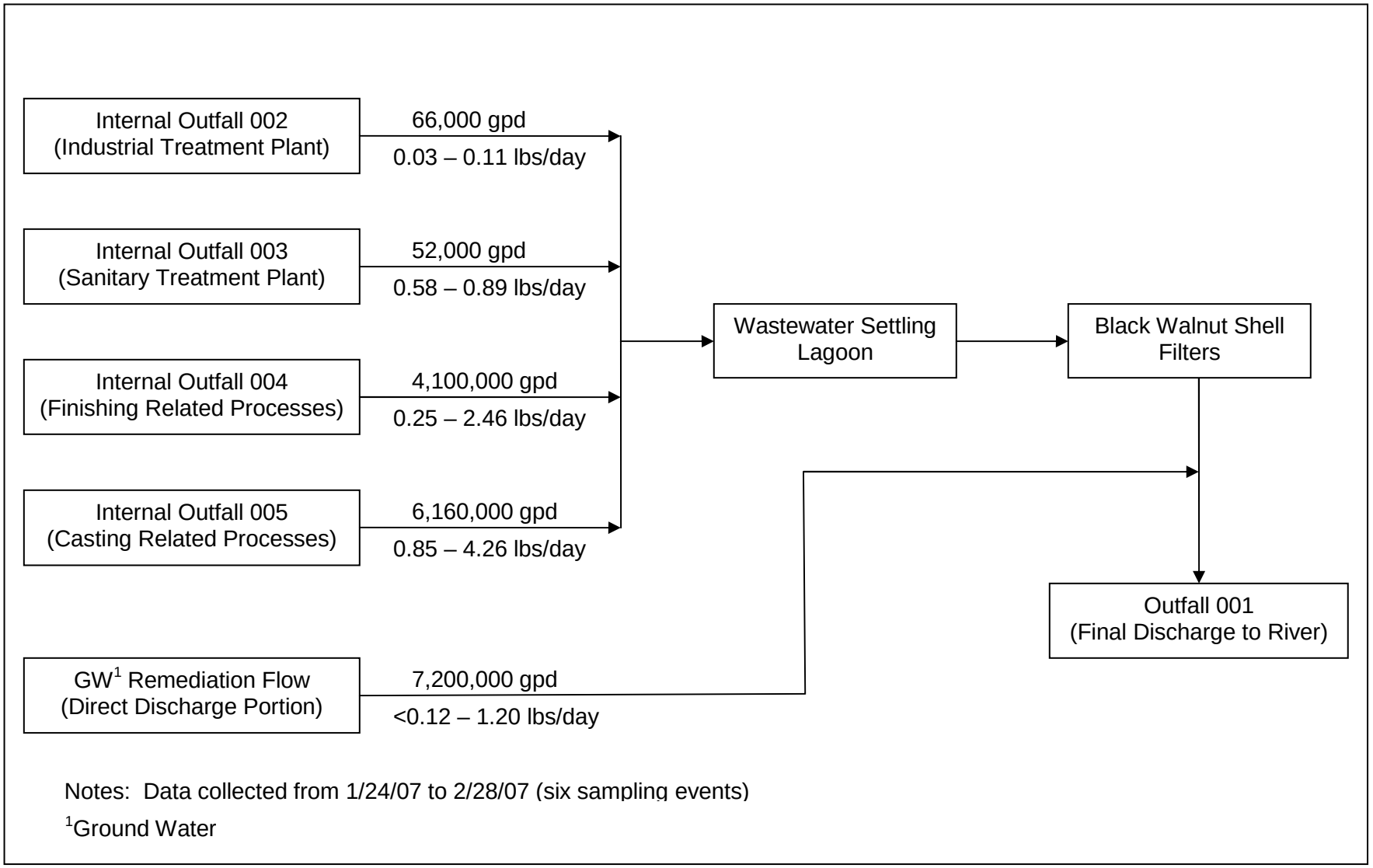

Figure 2: Summary of Internal Phosphorus Loadings, Kaiser Aluminum

Table 1: Summary of Effluent Information, Kaiser Aluminum

Routine Monitoring Data								
	Outfall 001		River Intake		Outfall 002		Outfall 003	
Parameter	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Flow, MGD	15.7	21.0	3.09	6.51	0.068	.316	0.041	0.500
pH, s.u.	6.5 (min), 7.1 (avg), 8.5 (max)		-	-	-	-	6.0 (min), 7.1 (avg), 8.2 (max)	
Temp, ℉	54.8	71.5	49.8	69.6	-	-	-	-
Chromium, lbs/day	0.01	2.03	0.01	2.03	0.0001	0.017	-	-
Zinc, lbs/day	1.9	10.0	1.4	2.7	0.02	0.09	-	-
Aluminum, lbs/day	0.1	7.7	0.56	5.0	0.33	4.9	-	-
Oil and Grease, lbs/day	97	415	9	88	4.5	35.3	-	-
TSS, lbs/day	63	829	38	202	9.3	80	-	-
Total PCBs[1], pg/L	779	3,076	-	-	-	-	-	-
Total Phosphates, lbs/day	-	-	-	-	0.23	1.78	0.3	2.5
Ortho-Phosphate, lbs/day	-	-	-	-	0.07	0.37	-	-
BOD_5, mg/L	-	-	-	-	-	-	6	17
TSS, mg/L	-	-	-	-	-	-	4.2	11.2
Fecal Coliform, #/100ml	-	-	-	-	-	-	0	3

[1] Results from individual congener testing reported as total aroclors.

Table 2: Production Basis, Kaiser Aluminum

Existing Production:		Production in lbs/day: Est Daily Max	Single Month Daily Max	Period Daily Average	Production Used in Effluent Guidelines (lbs/day)	Production Used in Effluent Guidelines (million lbs/day)
Date	Rolling with Neat Oils:					
4/04-8/06	Core w/o Annealing Furnace Scrubber	601,085	501,085	331,283	501,085	0.501
4/04-8/06	Solution Heat Treatment Contact Cooling Water	164,231	136,859	92,250	136,859	0.137
Date	Rolling with Emulsions:					
4/04-8/05	Core	26,336,488	16,257,091	14,083,603	16,257,091	16.257
4/04-8/05	Direct Chill Casting Contact Cooling Water	1,309,561	948,957	936,111	948,957	0.949
4/04-8/05	Solution Heat Treatment Contact Cooling Water	553,681	461,401	417,578	461,401	0.461
Additional Horizontal Heat Treat Production (6/07 update):						
	Rolling with Emulsions:					
	Core	11,900,000	-	7,400,000	7,400,000	7.40
	Direct Chill Casting Contact Cooling Water	1,150,000	-	800,000	800,000	0.80
	Solution Heat Treatment Contact Cooling Water	696,000	-	580,000	580,000	0.58

Table 3: Calculation of Production Based Limits for Outfall 002 (IWT), Kaiser Aluminum

Existing Production:		
Rolling with Neat Oils:		
Core w/o Annealing Furnace Scrubber	0.501	M lbs/day (million lbs/day)
Rolling with Emulsions:		
Core	16.257	M lbs/day
Additional Horizontal Heat Treat Production:		
Rolling with Emulsions:		
Core	7.40	M lbs/day

Subpart A - Rolling with Neat Oils **BPT/BAT**
Core without Annealing Furnace Scrubber **Production: 0.501 M lbs/day**

	lbs/million off lbs of aluminum rolled with neat oils				Total lbs	
	BPT		BAT		BPT/BAT	
	Daily Avg	Month Avg	Daily Max	Month Avg	Daily Avg	Month Avg
Chromium	0.0244	0.01	0.025	0.01	0.0125	0.0050
Cyanide	0.0161	0.0067	0.016	0.0067	0.0080	0.0034
Zinc	0.0808	0.0338	0.081	0.034	0.0406	0.0170
Aluminum	0.356	0.174	0.356	0.174	0.1784	0.0872
O&G	1.11	0.644	-	-	0.5562	0.3227
TSS	2.27	1.079	-	-	1.1375	0.5407
pH, s.u.	within 7-10		within 7-10			

Subpart B - Rolling with Emulsions **BPT/BAT**
Core **Production: 23.657 M lbs/day**
(includes additional Core production)

	lbs/million off lbs of aluminum rolled with emulsions				Total lbs	
	BPT		BAT		BPT/BAT	
	Daily Avg	Month Avg	Daily Max	Month Avg	Daily Avg	Month Avg
Chromium	0.057	0.024	0.057	0.024	1.3485	0.5678
Cyanide	0.038	0.016	0.038	0.016	0.8990	0.3785
Zinc	0.19	0.079	0.19	0.079	4.4948	1.8689
Aluminum	0.84	0.416	0.84	0.42	19.8720	9.8413
O&G	2.6	1.56	-	-	61.5084	36.9051
TSS	5.33	2.53	-	-	126.0923	59.8524
pH, s.u.	within 7-10		within 7-10			

	Resulting Total lbs	
Total	Daily Avg	Month Avg
Chromium	1.36	0.57
Cyanide	0.91	0.38
Zinc	4.54	1.89
Aluminum	20.1	9.93
O&G	62.1	37.23
TSS	127.2	60.4
pH, s.u.	within 7-10	

Table 4: Calculation of Production Based Limits for Outfall 006 (Process Wastewater), Kaiser Aluminum

Existing Production			
Rolling with Neat Oils:			
	Solution Heat Treatment Contact Cooling Water	0.137	M lbs/day (million lbs/day)
Rolling with Emulsions:			
	Direct Chill Casting Contact Cooling Water	0.949	M lbs/day
	Solution Heat Treatment Contact Cooling Water	0.461	M lbs/day
Additional Horizontal Heat Treat Production			
Rolling with Emulsions:			
	Direct Chill Casting Contact Cooling Water	0.800	M lbs/day
	Solution Heat Treatment Contact Cooling Water	0.580	M lbs/day

Subpart A - Rolling with Neat Oils **BPT/BAT**

Solution Heat Treatment Contact Cooling Water **Production** **0.137** **M lbs/day**

	lbs/million off lbs of aluminum quenched				lbs	
	BPT		BAT		BPT/BAT	
Parameter	Daily Max	Month Avg	Daily Max	Month Avg	Daily Max	Month Avg
Chromium	3.39	1.39	0.897	0.367	0.1228	0.0502
Cyanide	2.24	0.93	0.591	0.245	0.0809	0.0335
Zinc	11.25	4.7	2.974	1.243	0.4070	0.1701
Aluminum	49.55	24.66	13.1	6.518	1.7929	0.8920
O&G	154.1	92.46	-	-	21.0900	12.6540
TSS	315.91	150.25	-	-	43.2351	20.5631
pH	within 7-10		within 7-10		within 7-10	

Subpart B - Rolling with Emulsions **BPT/BAT**

Direct Chill Casting Contact Cooling Water **Production** **1.749** **M lbs/day** **(includes additional Direct Chill production)**

	lbs/million off lbs of aluminum cast				lbs	
	BPT		BAT		BPT/BAT	
Parameter	Daily Max	Month Avg	Daily Max	Month Avg	Daily Max	Month Avg
Chromium	0.59	0.24	0.59	0.24	1.0319	0.4197
Cyanide	0.39	0.16	0.39	0.16	0.6821	0.2798
Zinc	1.94	0.81	1.94	0.81	3.3930	1.4167
Aluminum	8.55	4.26	8.55	4.26	14.9536	7.4506
O&G	26.58	15.95	-	-	46.4873	27.8959
TSS	54.49	25.92	-	-	95.3007	45.3330
pH	within 7-10		within 7-10		within 7-10	

Table 4 (con'd) – Calculation of Production Based Limits for Outfall 006 (Process Wastewater), Kaiser Aluminum

Subpart B - Rolling with Emulsions **Production:** **BPT/BAT** **0.461** **M lbs/day**
Solution Heat Treatment Contact Cooling Water **NSPS** **0.580** **M lbs/day**

	lbs/million off lbs of aluminum quenched						lbs		lbs	
	BPT		BAT		NSPS		BPT/BAT		NSPS	
Parameter	Daily Max	Month Avg	Daily Max	Month Avg	Daily Max	Month Avg	Daily Max	Month Avg	Daily Max	Month Avg
Chromium	3.39	1.39	0.9	0.37	0.76	0.31	0.4153	0.1707	0.4408	0.1798
Cyanide	2.24	0.93	0.59	0.25	0.41	0.17	0.2722	0.1154	0.2378	0.0986
Zinc	11.25	4.7	2.98	1.25	2.08	0.86	1.3750	0.5768	1.2064	0.4988
Aluminum	49.55	24.66	13.1	6.52	12.45	5.52	6.0444	3.0083	7.2210	3.2016
O&G	154.1	92.46	-	-	20.37	20.37	71.1019	42.6611	11.8146	11.8146
TSS	315.91	150.25	-	-	30.56	24.45	145.7612	69.3255	17.7248	14.1810
pH	within 7-10		within 7-10		within 7-10		within 7-10		within 7-10	

	Total lbs	
Parameter	Daily Max	Month Avg
Chromium	2.01	0.82
Cyanide	1.27	0.53
Zinc	6.38	2.66
Aluminum	30.0	14.6
O&G	150.5	95.0
TSS	302.0	149.4
pH	within 7-10	

Table 5: Calculation of Non-Scope Allowances for Outfall 006 (Process Wastewater), Kaiser Aluminum

Outfall 004 + 005 Flow	7.90
%Non-Scope	85%
Non-Scope Flow	6.72

Development of Non-Scope Limits:

Treatment Effectiveness Limits LS&F

Parameter, mg/L	Daily Max	Month Avg
Chrome	0.37	0.1
Cyanide	-	-
Zinc	1.02	0.31
Aluminum	6.11	2.41
O&G	10	10
TSS	15	10

Non-Scope mass LS&F

Parameter, lbs/day	Daily Max	Month Avg
Chrome	20.7	5.6
Cyanide	-	-
Zinc	57.1	17.4
Aluminum	342.2	135.0
O&G	560.0	560.0
TSS	840.0	560.0

	Outfall 006 - Scope (from Table 4) + Non-Scope	
Parameter, lbs/day	Daily Max	Month Avg
Chromium	22.7	6.4
Cyanide	1.27	0.53
Zinc	63.5	20.0
Aluminum	372.2	149.5
O&G	710.5	655.1
TSS	1142.1	709.4
pH	within 7-10	

Table 6: Requirements for Mixing Zones

Requirements:	Actions:
The allowable size and location be established in a permit.	This permit specifies the size and location of the allowed mixing zone.
Fully apply "all known available and reasonable methods of treatment" (AKART).	The technology-based limitations determined to be AKART are discussed in an earlier Section of this fact sheet (see Technology-based Limitations).
Consider critical discharge condition.	The critical discharge condition is often pollutant-specific or water body-specific and is discussed above.
Supporting information clearly indicates the mixing zone would not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses, result in damage to the ecosystem or adversely affect public health.	The Department of Ecology has reviewed the information on the characteristics of the discharge, receiving water characteristics and the discharge location. Based on this information, Ecology believes this discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem or adversely affect public health.
Water quality criteria shall not be violated (exceeded) outside the boundary of a mixing zone.	A reasonable potential analysis, using procedures established by USEPA and the Department of Ecology, was conducted for each pollutant to assure there will be no violations of the water quality criteria outside the boundary of a mixing zone.
The size of the mixing zone and the concentrations of the pollutants shall be minimized.	The size of the mixing zone (in the form of the dilution factor) has been minimized by the use of design criteria with low probability of occurrence. For example, the reasonable potential analysis used the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor and the lowest flow occurring once in every 10 years. The concentrations of the pollutants in the mixing zone have been minimized by requiring pollution prevention measures where applicable.
Maximum size of mixing zone	The authorized mixing zone does not exceed the maximum size restriction.
Acute criteria met as near to the point of discharge as practicably attainable	The acute criteria have been determined to be met at 10% of the distance volume fraction of the chronic mixing zone at the ten year low flow.
The concentration of, and duration and frequency of exposure to the discharge, will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.	The toxicity of pollutants is dependent upon the exposure which in turn is dependent upon the concentration and the time the organism is exposed to that concentration. For example EPA gives the acute criteria for copper as "freshwater aquatic organisms and their uses should not be affected unacceptably if the 1- hour average concentration (in µg/l) does not exceed the numerical value given by (0.960)(e(0.9422[ln(hardness)] - 1.464)) more than once every three years on the average." The limited acute mixing zone authorized for this discharge will assure that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water assuring that it will not cause translocation of indigenous organism near the point of discharge.
Comply with size restrictions	The mixing zone authorized for this discharge meets the size restrictions of WAC 173-201A.
Overlap of Mixing Zones	This mixing zone does not overlap another mixing zone

Table 7: Comparison of Effluent Limits to Previous Permit, Kaiser Aluminum

Outfall 002				
	Existing		Proposed	
Parameter	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
Chromium, lbs/day	5.1	2.1	1.36	0.57
Cyanide, lbs/day	0.63	0.26	0.91	0.38
Zinc, lbs/day	3.08	1.3	4.54	1.89
Aluminum, lbs/day	25.0	10.0	20.1	9.93
Oil and grease, lbs/day	84	50	62.1	37.2
TSS, lbs/day	171	82	127.2	60.4
Cr (+6), lbs/day	0.2	0.16	-	-
O-PO_4 (P)(filtered), lbs/day	12.0	9.6	-	-

Outfalls 001 and 006				
	Existing[a]		Proposed[a]	
Parameter	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
Chromium, lbs/day	5.1	2.1	5.1	2.1
Cyanide, lbs/day	1.4	0.59	1.27	0.53
Aluminum, lbs/day	46.8	23.4	46.8	23.4
Oil and grease, lbs/day	1,102	668	710.5	655.1
TSS, lbs/day	3,037	1,453	1142.1	709.4
Zinc, µg/L	-[b]	-[b]	146	73
Lead, µg/L	-	-	5.9	3.4
Cadmium, µg/L	-	-	2.1	1.2
Total Phosphorus (as P)[c], lbs/day	-	11.8	3.0	1.3
pH, s.u.	within 6.0 to 9.0		within 6.0 to 9.0	
[a] Proposed permit limits for Chromium, Cyanide, Aluminum, and Oil & Grease will apply at Outfall 006; while proposed limits for Zinc, Lead, Cadmium, Total Phosphorus, and pH will continue to apply at Outfall 001				
[b] Previous permit limits included case-by-case determination of compliance with zinc water quality criteria				
[c] Measured by summing phosphorus discharged from Outfalls 002 and 003				

APPENDIX A - PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

The Department will publish a Public Notice of Draft (PNOD) on October 5, 2010 in the Spokesman Review to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Eastern Regional Office
4601 North Monroe Street
Spokane, WA 99205-1295.

Additionally, a public hearing will be held to take any additional written and verbal testimony on these permits. The hearing date will be on November 10, 2010 at Spokane Regional Health District auditorium, 1101 W. College Avenue, Spokane, Washington from 6:00 to 9:00 p.m.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within forty five (45) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone at (509) 329-3400 or by writing to the address listed above.

APPENDIX B - GLOSSARY

Acute Toxicity - The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART - An acronym for "all known, available, and reasonable methods of treatment".

Ambient Water Quality - The existing environmental condition of the water in a receiving water body.

Ammonia - Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation - The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5 - Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass - The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine - Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity - The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA) - The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling - A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling - A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample - A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity - Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring - Uninterrupted, unless otherwise noted in the permit.

Critical Condition - The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor - A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report - A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria - Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample - A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater - Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility - A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation - The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL) - The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility - A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone - An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES) - The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH - The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL) - A calculated value five times the MDL (method detection level).

Responsible Corporate Officer - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-Based Effluent Limit - A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS) - Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters - Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater - That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset - An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-Based Effluent Limit - A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C - TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at http://www.ecy.wa.gov.

Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (1 of 3)

Effluent and Receiving Water Critical Conditions

Facility: **Kaiser Aluminum** Design Case: **Metals**
Receiving Water: **Spokane River**

CLICK HERE FOR INSTRUCTIONS	Effluent Data: Annual Average Flow	Effluent Data: Monthly Average Flow	Effluent Data: Daily Maximum Flow	Receiving Water Data: 7Q10 Critical Flow	Receiving Water Data: 30Q5 Critical Flow	Receiving Water Data: Harmonic Mean Flow	%flow for dilution
Flow (MGD)	**15.66**	**16.94**	**20.96**	329.61	447.89	988.84	**0**
(cfs)	24.23	26.21	32.43	**510.00**	**693.00**		
Critical Temp (°C)	**21.94**			**20.89**			
(°F)	71.5			69.6			
Critical Hardness (mg/L CaCO3)	**133.00**	Effluent Data ←		**30.00**	Receiving Water Data ←		
Critical pH (s.u.)	**9.00**			**8.10**			
Critical Alkalinity (mg/L as CaCO3)	**50.00**			**50.00**			

Enter own pH & Temp for Ammonia Criteria?	**n**	
	pH	Temp (°C)
@ Acute Boundary		
@ Chronic Boundary		

	Enter own Dilution Factors (DFs)?	**n**
	Acute DF	
	Chronic DF	
	Human Health (non C) DF	
	Human Health (Carcn) DF	

	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@Harmonic Mean River Flow (Carcn)
Dilution Factor	1.00	1.00	20.46	1.00	1.00
(% effluent)	100.00	100.00	4.89	100.00	100.00
Hardness	133.00	133.00	35.03	-	-
Alkalinity	50.00	50.00	50.00	-	-
Max pH (s.u.)	9.00	9.00	8.12	-	-
Max Temp (°C)	21.94	21.94	20.94	-	-
Max Temp (°F)	71.49	71.49	69.69	-	-

Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (2 of 3)

Pollutant, Effluent, and Receiving Water Data

Facility: Kaiser Aluminum
Receiving Water: Spokane River
Design Case: Metals

Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	Freshwater Quality Criteria acute ug/L	Freshwater Quality Criteria chronic ug/L	Metals Translators acute	Metals Translators chronic	Probability (0.95 - WQ Based; 0.5 - Human Health)	Enter Effluent Data: max effluent concentration (measured) ug/L	# of data points	Coefficient of Varation	#samples per month for compliance monitoring	50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise) ug/L	Enter RW Data: Ambient Concentration ug/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	5.043	1.273	0.943	0.943	0.95	**250.0**	**5**	**0.6**	**2**		
LEAD** - 7439921 7M	Y	WQ Stnd	88.0	3.428	0.466	0.466	0.95	**250.0**	**5**	**0.6**	**2**		
ZINC**- 7440666 13M	Y	WQ Stnd	145.7	133.1	0.996	0.996	0.95	**250.0**	**5**	**0.56**	**4**		

Note: Metals Translators derived from procedures in Permit Writer's Manual (Ecology, 2008), Table VI-1, page VI-6

Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (3 of 3)

Summary of Effluent Reasonable Potential Determination & Limits

Facility: Kaiser Aluminum
Receiving Water: Spokane River
Design Case: Metals

POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water: Upstream RW Conc, µg/L	Acute Boundary: RW Acute Criteria, µg/L	Acute Boundary: Conc @ Acute MZ Boundary, µg/L	Chronic Boundary: RW Chronic (or Human Health) Criteria, µg/L	Chronic Boundary: Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Permit Limits: Daily Maximum Limit, µg/L	Permit Limits: Monthly Average Limit, µg/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	581.1	YES	0.0	5.043	548.0	1.273	577.6	2.104	1.214
LEAD** - 7439921 7M	Y	WQ Stnd	581.1	YES	0.0	88.0	270.8	3.428	552.6	5.921	3.418
ZINC**- 7440666 13M	Y	WQ Stnd	553.3	YES	0.0	145.7	551.1	133.1	523.4	146.3	75.3

CORRECTED (Final Permit) -- Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (1 of 3)

Effluent and Receiving Water Critical Conditions

Facility: **Kaiser Aluminum Check** Design Case: **Reasonable Potential**
Receiving Water: **Spokane River**

CLICK HERE FOR INSTRUCTIONS	Effluent Data: Annual Average Flow	Effluent Data: Monthly Average Flow	Effluent Data: Daily Maximum Flow	Receiving Water Data: 7Q10 Critical Flow	Receiving Water Data: 30Q5 Critical Flow	Receiving Water Data: Harmonic Mean Flow	%flow for dilution
Flow (MGD)	**15.66**	**16.94**	**20.96**	329.61	447.89	988.84	**0**
(cfs)	24.23	26.21	32.43	**510.00**	**693.00**		
Critical Temp (1DMax or 7DADMax) ℃	**21.34**			**20.89**			
(℉)	70.4			69.6			
Critical Hardness (mg/L CaCO3)	**133.00**	Effluent Data		**25.50**	Receiving Water Data		
Critical pH (s.u.)	**9.00**	←		**7.90**	←		
Critical Alkalinity (mg/L as CaCO3)	**50.00**			**18.00**			

Enter own pH & Temp for Ammonia Criteria?	**n**		Enter own Dilution Factors (DFs)?	**n**
	pH	Temp (℃)	Acute DF	
@ Acute Boundary			Chronic DF	
@ Chronic Boundary			Human Health (non C) DF	
			Human Health (Carcn) DF	

	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@Harmonic Mean River Flow (Carcn)
Dilution Factor	1.00	1.00	20.46	1.00	1.00
(% effluent)	100.00	100.00	4.89	100.00	100.00
Hardness	133.00	133.00	30.75	-	-
Alkalinity	50.00	50.00	19.56	-	-
Max pH (s.u.)	9.00	9.00	7.95	-	-
Max Temp (℃)	21.34	21.34	20.91	-	-
Max Temp (℉)	70.41	70.41	69.64	-	-

CORRECTED (Final Permit) -- Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (2 of 3)

Pollutant, Effluent, and Receiving Water Data

Facility Kaiser Aluminum Check
Receiving Water Spokane River
Design Case Reasonable Potential

Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	Freshwater Quality Criteria acute ug/L	Freshwater Quality Criteria chronic ug/L	Metals Translators acute	Metals Translators chronic	Probability (0.95 - WQ Based; 0.5 - Human Health)	Enter Effluent Data: max effluent concentration (measured) ug/L	# of data points	Coefficient of Varation	#samples per month for compliance monitoring	50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise) ug/L	Enter RW Data: Ambient Concentration ug/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	5.043	1.273	0.943	0.943	0.95	250.0	5	0.6	2		
LEAD** - 7439921 7M	Y	WQ Stnd	88.0	3.428	0.466	0.466	0.95	250.0	5	0.6	2		
ZINC**- 7440666 13M	Y	WQ Stnd	145.7	133.1	0.996	0.996	0.95	250.0	5	0.56	4		

CORRECTED (Final Permit) -- Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (3 of 3)

Summary of Effluent Reasonable Potential Determination & Limits

Facility: Kaiser Aluminum Che
Receiving Water: Spokane River
Design Case: Reasonable Potential

POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water: Upstream RW Conc, µg/L	Acute Boundary: RW Acute Criteria, µg/L	Acute Boundary: Conc @ Acute MZ Boundary, µg/L	Chronic Boundary: RW Chronic (or Human Health) Criteria, µg/L	Chronic Boundary: Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Permit Limits: Daily Maximum Limit, µg/L	Permit Limits: Monthly Average Limit, µg/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	581.1	YES	0.0	5.043	548.0	1.273	548.0	2.217	1.28
LEAD** - 7439921 7M	Y	WQ Stnd	581.1	YES	0.0	88.0	270.8	3.428	270.8	12.1	6.975
ZINC**- 7440666 13M	Y	WQ Stnd	553.3	YES	0.0	145.7	551.1	133.1	551.1	146.3	75.3

Reasonable Potential Determination for Aluminum and Chromium (1 of 3)

Effluent and Receiving Water Critical Conditions

Facility: **Kaiser Aluminum**
Receiving Water: **Spokane River**

Design Case: **Reasonable Potential**

CLICK HERE FOR INSTRUCTIONS	Effluent Data: Annual Average Flow	Effluent Data: Monthly Average Flow	Effluent Data: Daily Maximum Flow	Receiving Water Data: 7Q10 Critical Flow	Receiving Water Data: 30Q5 Critical Flow	Receiving Water Data: Harmonic Mean Flow	%flow for dilution
Flow (MGD)	**15.66**	**16.94**	**20.96**	329.61	447.89	988.84	**25**
(cfs)	24.23	26.21	32.43	**510.00**	**693.00**		
Critical Temp (℃)	**21.94**			**20.89**			
(℉)	71.5			69.6			
Critical Hardness (mg/L CaCO3)	**133.00**	Effluent Data ←		**30.00**	Receiving Water Data ←		
Critical pH (s.u.)	**9.00**			**8.10**			
Critical Alkalinity (mg/L as CaCO3)	**50.00**			**50.00**			

Enter own pH & Temp for Ammonia Criteria?	**n**			Enter own Dilution Factors (DFs)?		**n**
	pH	Temp (℃)		Acute DF		
@ Acute Boundary				Chronic DF		
@ Chronic Boundary				Human Health (non C) DF		
				Human Health (Carcn) DF		

	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@Harmonic Mean River Flow (Carcn)
Dilution Factor	1.39	5.86	20.46	7.61	16.79
(% effluent)	71.78	17.05	4.89	13.14	5.96
Hardness	103.93	47.56	35.03	-	-
Alkalinity	50.00	50.00	50.00	-	-
Max pH (s.u.)	8.53	8.17	8.12	-	-
Max Temp (℃)	21.64	21.07	20.94	-	-
Max Temp (℉)	70.96	69.92	69.69	-	-

Reasonable Potential Determination for Aluminum and Chromium (2 of 3)

Pollutant, Effluent, and Receiving Water Data

Facility Kaiser Aluminum
Receiving Water Spokane River
Design Case Reasonable Potential

Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	Freshwater Quality Criteria acute ug/L	Freshwater Quality Criteria chronic ug/L	Metals Translators acute	Metals Translators chronic	Probability (0.95 - WQ Based; 0.5 - Human Health)	Enter Effluent Data: max effluent concentration (measured) ug/L	# of data points	Coefficient of Varation	#samples per month for compliance monitoring	50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise) ug/L	Enter RW Data: Ambient Concentration ug/L
ALUMINUM, total recoverable, pH 6.5-9.0 7429905	N	WQ Stnd	750.0	n/a	0.0	0.0	0.95	**601.0**	**55**	**0.6**	**4**		
CHROMIUM(TRI)** -7440473 5M	N	WQ Stnd	566.4	96.9	0.0	0.0	0.95	**65.5**	**55**	**0.6**	**4**		

Reasonable Potential Determination for Aluminum and Chromium (3 of 3)

Summary of Effluent Reasonable Potential Determination & Limits

Facility: Kaiser Aluminum
Receiving Water: Spokane River
Design Case: Reasonable Potential

POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water: Upstream RW Conc, µg/L	Acute Boundary: RW Acute Criteria, µg/L	Acute Boundary: Conc @ Acute MZ Boundary, µg/L	Chronic Boundary: RW Chronic (or Human Health) Criteria, µg/L	Chronic Boundary: Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Permit Limits: Daily Maximum Limit, µg/L	Permit Limits: Monthly Average Limit, µg/L
ALUMINUM, total recoverable, pH 6.5-9.0 7429905	N	WQ Stnd	610.6	NO	0.0	750.0	438.3	n/a	104.1		
CHROMIUM(TRI)** -7440473 5M	N	WQ Stnd	66.5	NO	0.0	566.4	47.8	96.9	11.3		